Concordia University
Department of Computer Science and Software Engineering

SOEN422 Fall 2020
Lab C
UART And SPI Communication

Purpose

The goal of this lab is to provide exercises on communication involving UART and SPI. These communication protocols form the basis of many systems and device interconnections. For all of these tasks, **you are not to use the Arduino Serial or SPI libraries**. Submit a report alongside your code in `.PDF`, detailing design decisions and anything else of note. Your submission should include both the code and report contained in a `.zip` file.

Task 1: UART Controlled LED

The first task is to create a program that runs in bare C to control the onboard LED of an Arduino. The user should send the character 'a' via the Serial Monitor in the Arduino IDE to turn on the onboard LED and '2' to turn off the LED.

Task 2: UART Greeting

The second task is to send a name via the Arduino Serial Monitor to the Arduino and receive a greeting back with the name. Your program should be able to dynamically (no pre-allocation) handle strings up to 40 characters.

Task 3: SPI Controlled LED

Using the second Arduino Nano as an SPI slave, the user should input the characters used from Task 1 to transmit to the Arduino SPI Master, which will then send a command to the SPI slave to turn on or off its onboard LED. Additionally, the SPI slave is to send a confirmation of the action back to the SPI master and display it to the user on the Serial Monitor.